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ABSTRACT

This report compares various factors associated with educational reform to student outcomes in Calumet Region (Lake and Porter Counties) in northwest Indiana. Specifically, this study examines the influence of these factors on students' educational success as measured by an index of excellence: a composite measure that includes attendance rates; graduation rates; and average student scores from Indiana Statewide Testing for Educational Progress, the Cognitive Schools Index, and the Scholastic Aptitude Test. Scores were computed for 23 school corporations and over 200 elementary, middle, and high schools in the Calumet Region. Findings included the following: (1) higher total expenditures per pupil or higher teacher salaries did not affect student outcomes; (2) surprisingly, higher index scores were associated with higher pupil-teacher ratios in elementary, junior high, and middle schools, but this trend did not hold true in high schools; (3) there was a weak tendency for student outcomes to worsen as school size increased; (4) teacher-administrator ratios were negatively related to index scores; (5) higher index scores were associated with younger, less experienced teachers; (6) higher index scores were found in schools that offered either a modest curriculum or an expanded curriculum; and (7) lower index scores were associated with higher percentages of students receiving free or reduced-cost lunches. Overall, there was little evidence that any factor had a significant impact on student outcomes, and therefore, the reforms related to these factors are misdirected. Appendix includes a list of variables used in the report, information about the index of excellence, a list of school corporations and schools and their index scores, and an explanation of the statistics used. (LP)

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Calumet Region Schools

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Summer 1995

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Heartland Center serves the people of Northwest Indiana through research on social issues, educational programs, leadership training, and grassroots coalition building. Its mission is to work in solidarity with the poor toward the construction of a more just and human society. The Center is a joint project of the Catholic Diocese of Gary and the Chicago Province of the Society of Jesus.

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Heartland Center Reports

Calumet Region Schools

Summer 1995

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Introduction

Since schools are among our most important social institutions and since they are widely perceived as *troubled*, the many proposals for school reform receiving public attention have been offered from almost every sector of civil society. Parents, school professionals, university academics, taxpayers and politicians—all have unique credentials and *expert* opinions.

Given the number and variety of proposed educational reforms, one might ask which, if any, deserve more serious consideration. In an ideal world, every proposal would receive careful scrutiny, adequate funding and timely implementation. Ours, though, is not a perfect world. Our communities have limited resources.

This paper will survey some popular school reform proposals and examine the extent to which the logic of the reforms is validated by comparisons among Calumet Region schools.[1] These comparisons will be made by means of an Index of Excellence. This index is a composite measure of student performance: attendance rates, graduation rates, average Indiana Statewide Testing for Educational Progress (ISTEP) scores, average Cognitive Schools Index (CSI) scores, and average Scholastic Aptitude Test (SAT) scores. (For a fuller description of the Index of Excellence, see Appendix I).

This paper's relatively narrow purpose may be easily misinterpreted. The paper will not attempt to identify which, if any, school reforms should be implemented. Instead, it will clarify the relative merit of various school reforms so as to suggest which, if any, deserve public discussion and debate. While this is a modest goal, we believe it is no less important. Our communities have limited attention spans for public discussions of social issues. For that reason, community leaders will want to know for what goals they want to engage the public, and we hope those goals will be those which offer the best opportunities to our children. It may well be that reforms which have already been canonized as ***the*** answer to our schools' perceived troubles will not increase those opportunities. If that is the case, community leaders may wish to reconsider the causes on behalf of which they want to engage the public since reforms which don't manifest rewards will only increase the public's cynicism.

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[1] There are 25 school districts in Northwest Indiana, that is, Lake and Porter Counties. Of these, 23 are included in this study. Two—the Northwest Indiana Special Education Coop and the Porter County Education Interlocal Special Education Coop—have not been included because they serve special students.

The study also utilizes data on individual schools within the 23 covered districts. With few exceptions, all schools are included. The exceptions are

Lake Central School Corporation	West Lake Education Coop
School City of East Chicago	Roxana Addition School Emilio de la Garza Career Center
Gary Community School Corporation	Middle School Academy Mary M Bethune Early Child Development Center Lincoln Achievement Center Martin Luther King School Gary Technical Vocational Center
School City of Hammond	Area Career Center
Valparaiso Community Schools	Porter County Career Center

I. Total Expenditures

Few proposals for school reform advocate simply throwing more money at our schools. Still, it seems appropriate to ask what, if any, bang the public receives for its buck since one suspects that many believe our schools' problems could be miraculously cured if only "they had enough money."

Figure 1 plots the relationship between total expenditure per pupil and Index of Excellence score for the Region's school corporations. There is virtually no discernable pattern in the plot. Indeed, one is tempted to say that the collection of dots is actually a shotgun shell's spray pattern.

The School Town of Munster (4740) spent approximately $6,040 per pupil and has an Index of Excellence score of 99.6. Lake Ridge Schools (4650) spent only $200 less per pupil and has an Index of Excellence score of 81.2.

The School City of Whiting (4760) spent more per pupil than any other district in the region and has a nearly average Index of Excellence score. The Hannover Community School Corporation

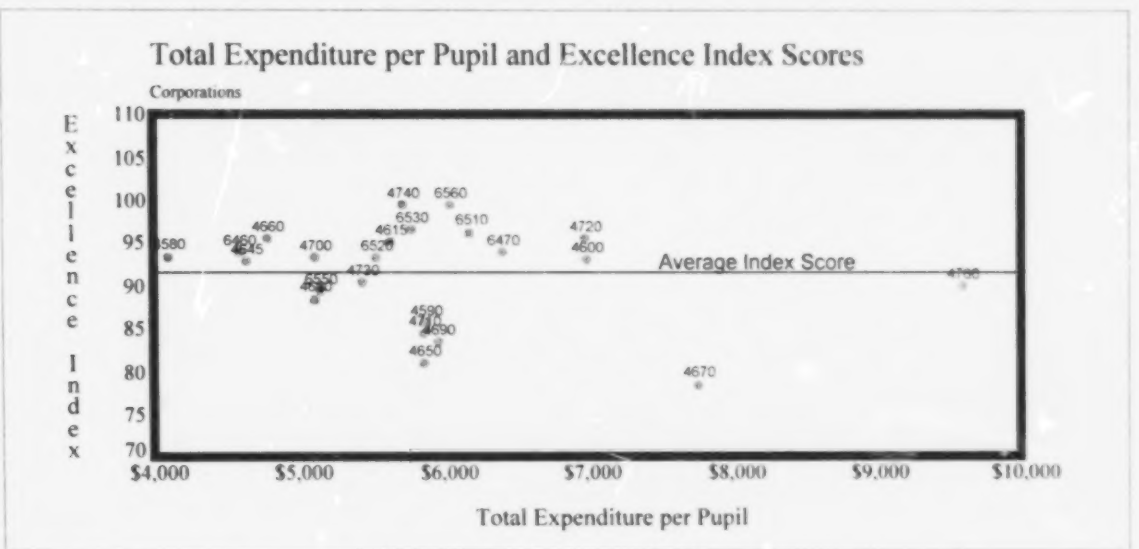

Figure 1

(4580) spent approximately $5,500 less per pupil than the School City of Whiting but has a significantly higher Index of Excellence score.[2]

While every comparison must be nuanced, a comparison of total expenditure per pupil and educational outcomes suggests that spending more will not necessarily improve our schools. If spending more ineluctably resulted in better outcomes, the School City of Whiting would be the Region's best school system. It isn't. Hannover Community Schools, by the same token, would be the region's worst since it spends less per pupil than any other district. They aren't. The School Town of Munster and the Lake Ridge Schools should have approximately equal educational outcomes. They don't. Spending more will not necessarily produce more capable students.

[2] For those interested in a more technical description of Figure 1, its Pearson Correlation is -0.233. This means that there is a weak tendency for Index scores to fall as expenditures increase. However, the regression for the data is virtually flat.

II. Teachers' Salaries

While few proposals for school reform suggest indiscriminately spending more on our schools, many do advocate increasing teachers' salaries. Proponents of increased teaching salaries argue that higher salaries will attract more highly qualified persons to the teaching profession. Additionally, it is argued that higher salaries will improve the morale of people already in the profession. Thus, increased teachers' salaries will produce both immediate and long-term results since more talented and more content teachers will inevitably produce more capable students.

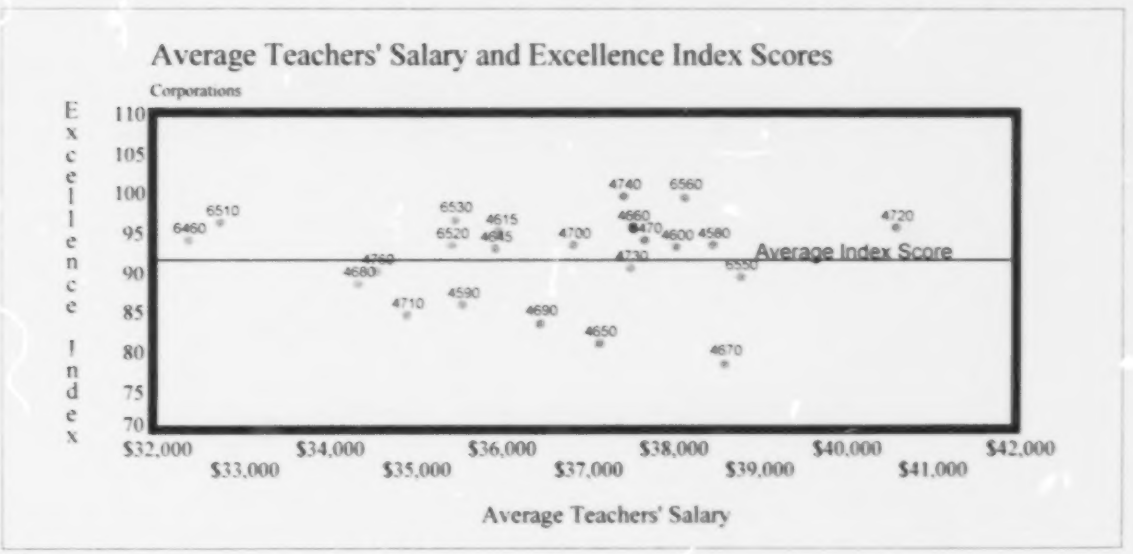

Figure 2

Figure 2 plots the relationship between average teachers' salaries and Excellence Index scores. Even the most cursory glance at the plot suggests the absence of any discernable pattern in the plot.

The School Town of Highland (4720) paid the highest average teachers' salary while the East Porter County School Corporation (6510) paid the lowest. Both have the same Index of Excellence score.

The School City of East Chicago (4670) paid an average teachers' salary of $38,644 while Portage Township Schools paid roughly the same amount: $38,809. In other words, Portage Township Schools' average salary was only $165 higher than East Chicago's. Nonetheless, the School City of East Chicago's students had the lowest Index of Excellence score in the Region while Porter Township Schools' were nearly average.[3]

While it is impossible to deny the claim that higher salaries will attract more qualified persons to the teaching profession, one must say that more highly paid teachers do not necessarily make for a better students outcomes. The School Town of Highland paid the highest salaries and

[3] Figure 2: Pearson Correlation is -0.004, that is, there is negligible a tendency for student outcomes to actually decline as teachers' salaries increase.

does have a high Excellence of Index score; however, its score isn't the highest score. East Porter County Schools had the fourth highest Index of Excellence score yet paid the second lowest average wage.

III. Pupil-Teacher Ratios

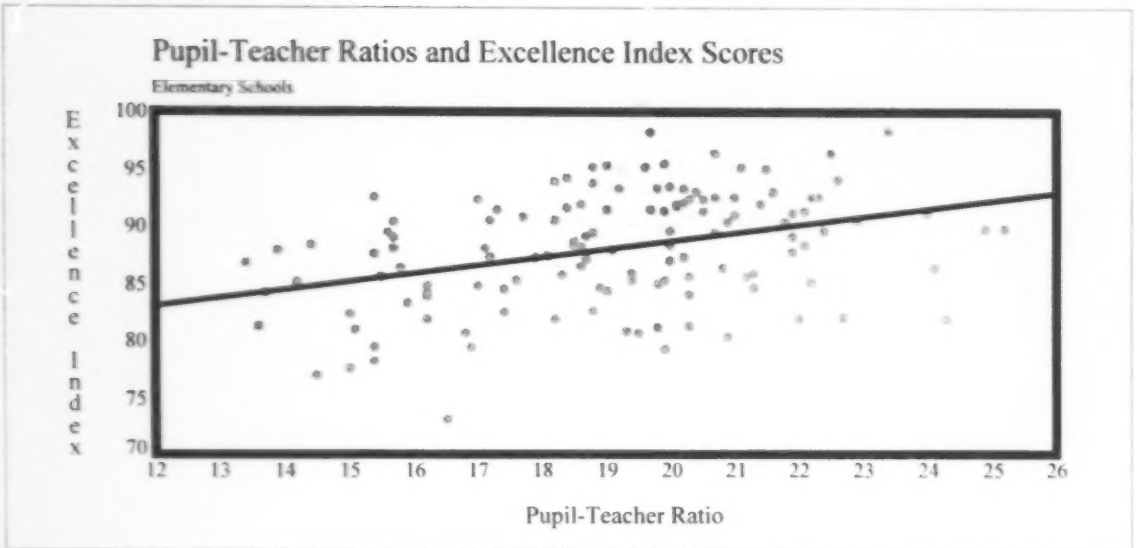

Figure 3

Many proposals for school reform advocate lower pupil-teacher ratios. It's argued that if teachers are asked to teach fewer students, their instruction will be both more individualized and more personal. They would be free to teach their students at whatever pace each student could achieve. Perhaps equally important, they could give each student a level of personal attention which would motivate him or her to succeed. Better pupil-teacher ratios are a sure-fired formula for success.

While the argument on behalf of better pupil-teacher ratios is intuitively appealing, the evidence supports a very different conclusion. Figure 3 plots pupil-teacher ratios and Excellence Index scores for the region's 129 elementary schools. One will note that a pattern is discernable in this plot. As pupil-teacher ratios increase, there tends to be a corresponding increase in Excellence Index scores.[4]

The line which runs diagonally from the lower left corner to the upper right corner of Figure 3 is a regression line. A regression line graphically represents the pattern which best describes the relationship of cases within a data set. In this case, it suggests that elementary schools in which teachers have more rather than fewer students are schools with higher Excellence Index scores.

This is a surprising conclusion since it runs contrary to the intuitively appealing argument

[4] Figure 3: The Pearson Correlation is 0.375; there is, in other words, a moderately strong tendency for student outcomes to improve as pupil-teacher ratios increase.

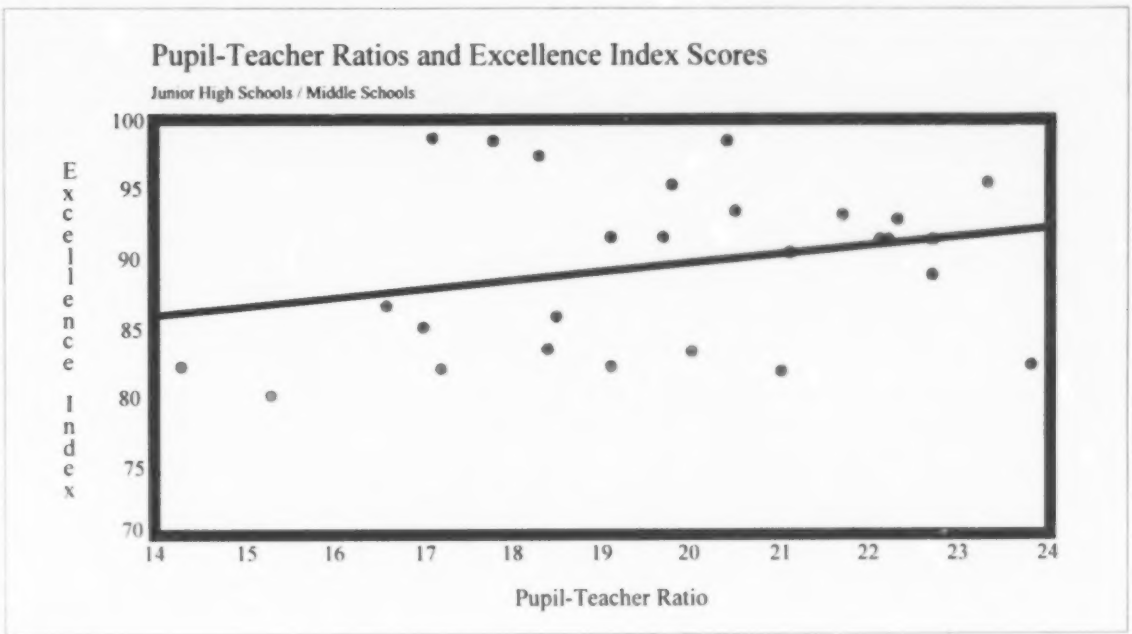

Figure 4

advanced by proponents of lower pupil-teacher ratios. One caution and a possible explanation suggest themselves.

The caution concerns the interpretation of the regression line. A regression line not only illustrates the pattern inherent in a data set; it may also be used to predict values which lie beyond

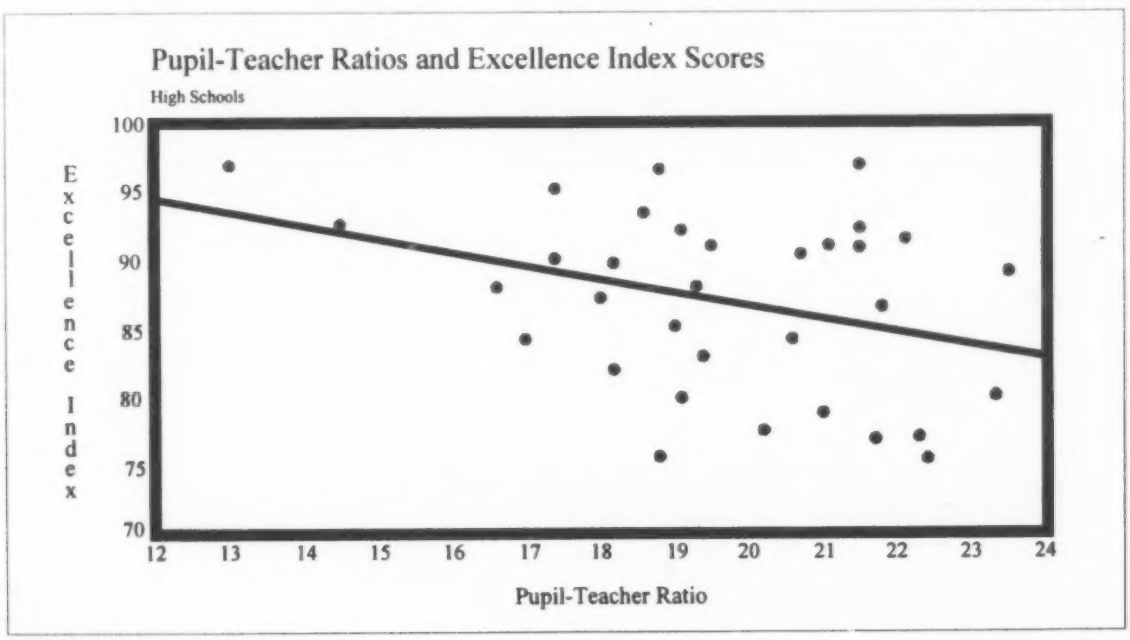

Figure 5

the scope of the data set. One could argue, for example, that since schools with pupil-teacher ratios of 22 to 1 tend to be better than schools with pupil-teacher ratios of 16 to 1, then schools with pupil-teacher ratios of 44 to 1 will be better than schools with pupil-teacher ratios of 22 to 1. However, predicting values which lie beyond the range of the existing data is somewhat risky since the relationship between pupil-teacher ratios and student outcomes may not be linear beyond the existing data's range. At a certain point, it is quite possible, even likely, that larger classes will produce declining outcomes.

Still, within the range of pupil-teacher ratios presented by the data, it remains true that schools with high pupil-teacher ratios have higher Index of Excellence scores, and one may well wonder how this can be the case. One possible explanation is suggested by the nature of the Index of Excellence. The Excellence Index is composed from a set of average scores—***average*** ISTEP scores, ***average*** CSI scores, etc. Averages, by their very nature, are measures of central tendency. They diminish the importance of extremes—both highs and lows. It might be the case that lower pupil-teacher ratios ironically produce higher highs and lower averages. If teachers are free to give more personal, individualized instruction, they may be inclined to give that attention to their most capable students. If so, other students might receive correspondingly less attention. As a result, the most capable students would do very well on standardized tests such as the ISTEP or CSI while others would do less well. Thus, there would be both higher highs and lower averages. Schools, in other words, would reflect both the strength and the weakness of a market which values extraordinary accomplishment.

Figure 4 plots the relationship between pupil-teacher ratios and Excellence Index scores for junior high schools/middle schools while Figure 5 plots the same relationship for high schools. Figure 4 resembles Figure 3;[5] however, Figure 5 presents a rather different picture.[6] While junior high schools/middle schools present the same dilemma as that posed by elementary schools, high school students do seem to benefit from lower pupil-teacher ratios.

Do lower pupil-teacher ratios tend to produce better student outcomes? Our answer must be yes and no. No, among elementary and junior high school/middle school students. Yes, among high schools students. It may well be the case that earlier reform movements which succeeded in limiting maximum class sizes in elementary schools have had more than their anticipated salutary effect while high schools have suffered from the lack of similar limits.

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[5] Figure 4: The Pearson Correlation is 0.270. In other words, among both junior high schools/middle schools and elementary schools, there is a tendency for student outcomes to improve as pupil-teacher ratios increase. However, the trend is less strong among junior high schools/middle schools.

[6] Figure 5: The Pearson Correlation is -0.353. In other words, the relationship between Index scores and pupil-teacher ratios is almost as strong among high schools as it is among elementary schools. However, the relationship is opposite in direction. Among elementary schools, Index scores tend to ***increase*** as pupil-teacher ratios increase. Among high schools, Index scores tend to ***decrease*** as pupil-teacher ratios increase.

IV. School Size

An argument similar to that advanced on behalf of lower pupil-teacher ratios is also advanced on behalf of smaller rather than larger schools. It's argued that smaller schools engender more harmonious relationships within the school and that the warmer environment will engender better outcomes.

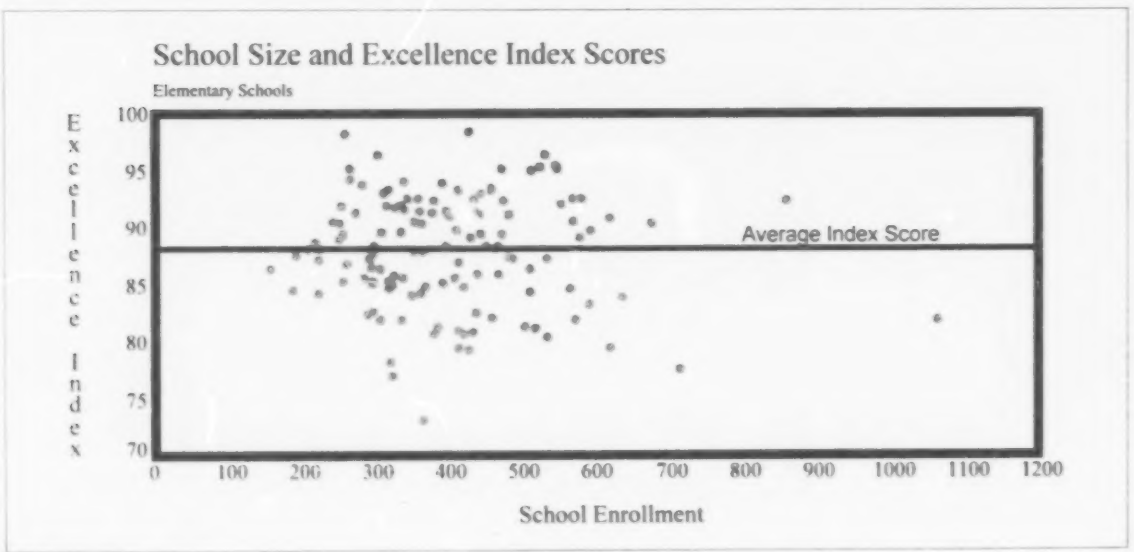

Figure 6

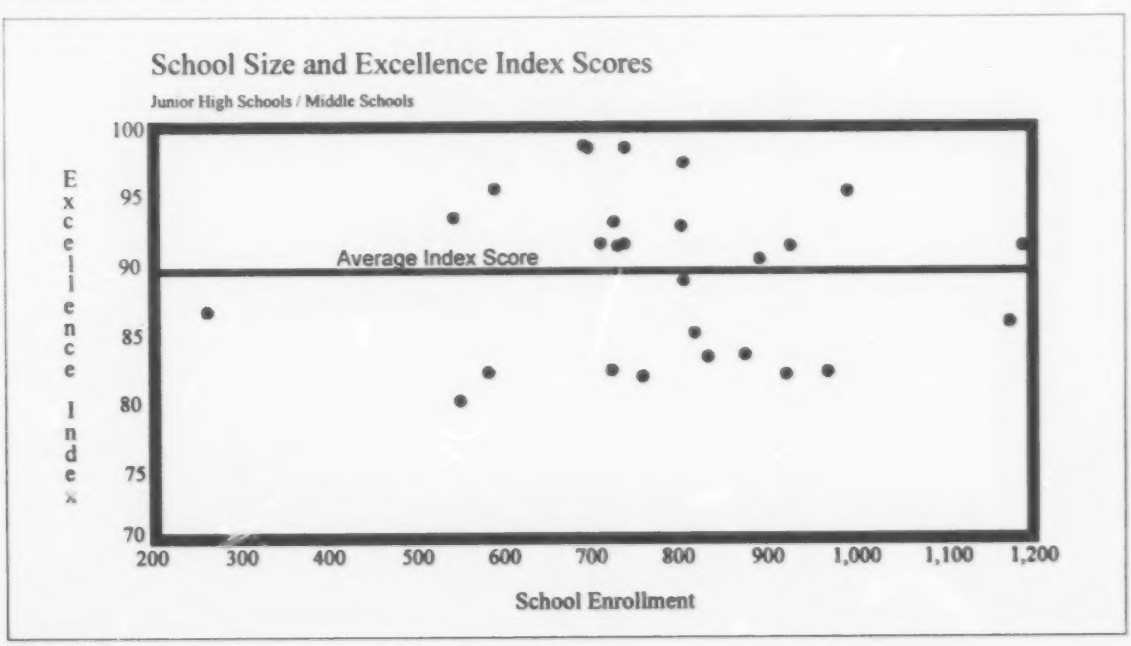

Figure 7

Like the argument on behalf of lower pupil-teacher ratios, the argument for smaller schools is intuitively appealing. Unfortunately, the data suggests that size alone does not produce better outcomes.

Figures 6, 7 and 8 plot the relationship between school size (enrollment) and Excellence Index scores for elementary schools, junior high schools/middle schools, and high schools.[7] Only among high schools is there evidence of a pattern, and that evidence is weak. Among high schools, Excellence Index scores tend to decline as school sizes increase. This pattern is indicated by the regression line drawn in Figure 8. However, given the wide dispersion of cases on both sides of this line, the regression equation it represents is of little value.

While there is some evidence to suggest that smaller schools are in fact better schools, the evidence is modest. It may well be the case that school size is very relevant when considered in

Figure 8

conjunction with other factors. If, for example, a faculty was disposed to create a warm, caring school environment, then school size might be a help or hindrance in their pursuit of that goal. Unfortunately, it is virtually impossible to obtain data with which to test such an hypothesis.

[7] Figure 6: Among elementary schools, the Pearson Correlation is - 0.04. Figure 7: Among junior high schools/middle schools, it is also -0.04. Figure 8: Among high schools, it is -0.186. Only the latter statistic is impressive, but the impression is weak. However, it is may be noteworthy that all these statistics are negative, that is, there is a weak tendency for student outcomes to worsen as school sizes increase.

V. Teacher-Administrator Ratios

School reform proposals frequently embrace plans for the number of administrators. Some proposals suggest that the number of administrators should be reduced. Many proponents of such proposals argue that administrators are an unnecessary financial drain upon a school system. Other proposals suggest that the number of administrators should be increased. Proponents of increases in the number of administrators argue that classroom teachers need more supervision to insure instructional quality both within an individual school and among the schools in a given system.

While there isn't strong evidence to support either contention, the evidence is mixed. Figures 9, 10 and 11 plot teacher-administrator ratios and Excellence Index scores for elementary schools, junior high schools/middle schools and high schools.[8]

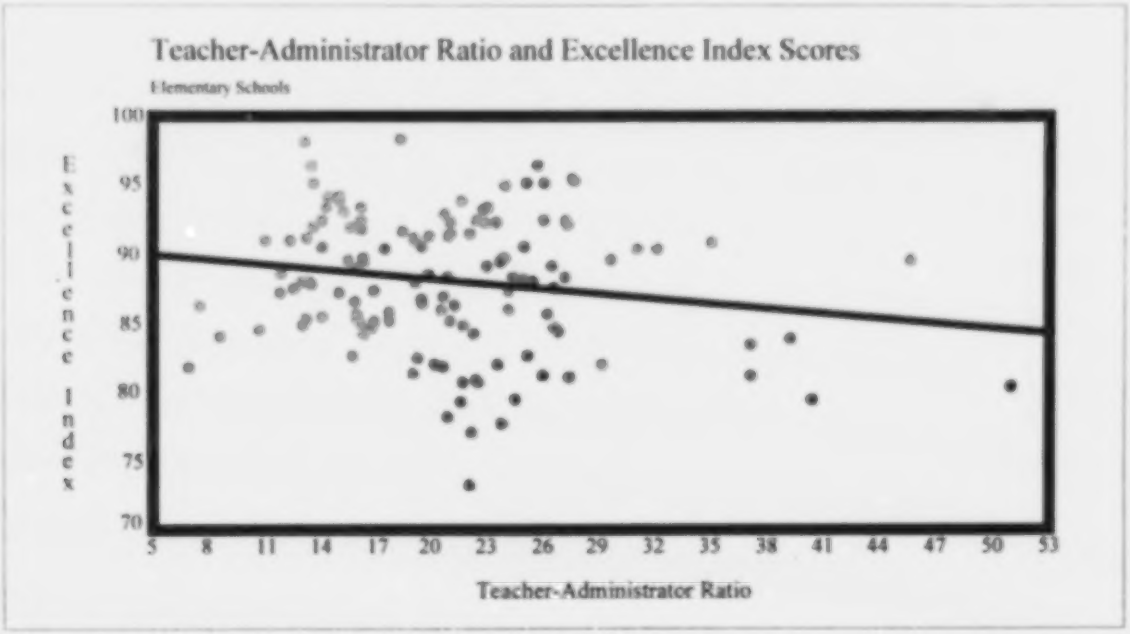

Figure 9

Among elementary schools, there is a weak negative correlation between the teacher-administrator ratios and Excellence Index scores. As the number of teachers per administrator increases, Excellence Index scores tend to decline. However, the tendency is not strong.

Among junior high schools/middle schools, there is a moderately strong positive correlation between teacher-administrator ratios and Excellence Index scores. As the number of teachers per administrator increases, Excellence Index scores also tend to increase. Again, the tendency is not especially strong. However, it is more marked than the opposite tendency is marked among elementary schools.

Among high schools, there is a moderately strong positive association between teacher-

[8] For elementary schools (Figure 9), the Pearson Correlation is -0.174; for junior high schools/middle schools (Figure 10), it is 0.255; and for high schools (Figure 11), it is 0.266.

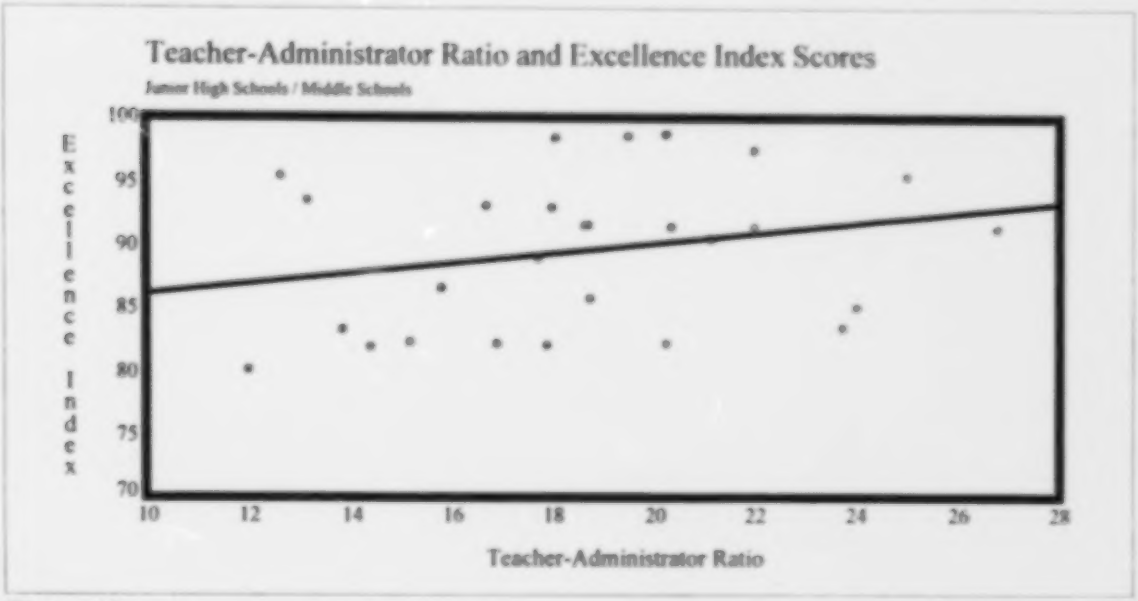

Figure 10

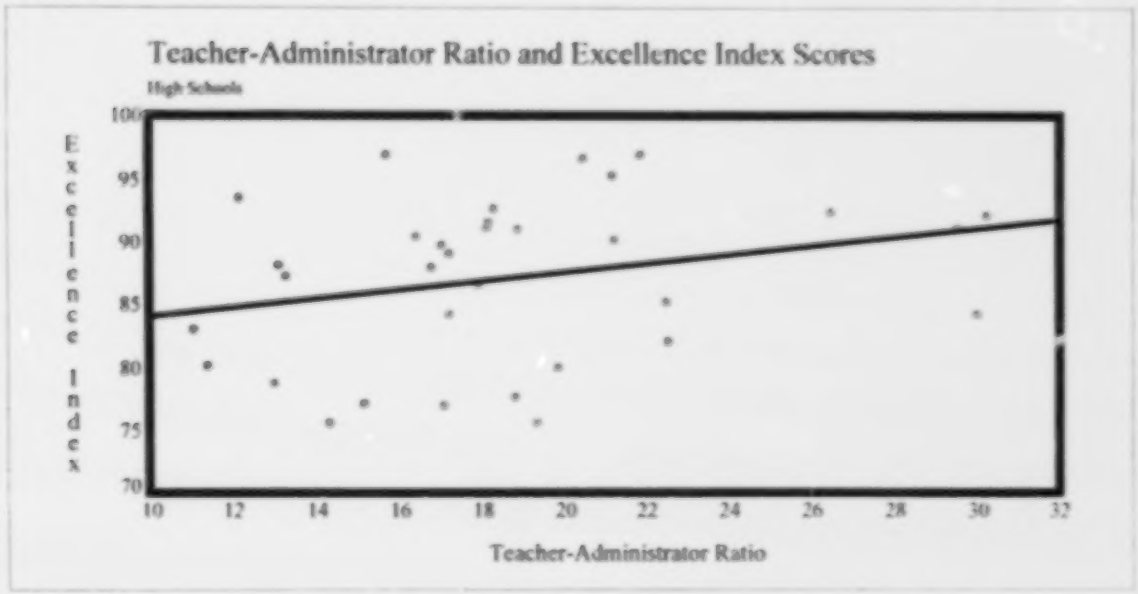

Figure 11

administrator ratios and Excellence Index scores. As the number of teachers per administrator increases, Excellence Scores tend to increase. This tendency is roughly equal to the same tendency among junior high schools/middle schools.

Given the mixed nature of the evidence, it is difficult to gauge the effect of teacher-administrator ratios on students outcomes. It's unlikely that the evidence is significantly affected by the size of individual schools since we know that school size has relatively little impact upon educational outcomes.

VI. Teacher Characteristics

It's frequently asserted that more experienced, mature teachers do a better job. In fact, most salary scales are composed of a base salary which is then incremented for years of experience. That is to say, it is almost axiomatic that more experienced teachers are better teachers. Despite the axiom, the evidence suggests that younger, less experienced teachers are actually more successful in achieving better student outcomes.

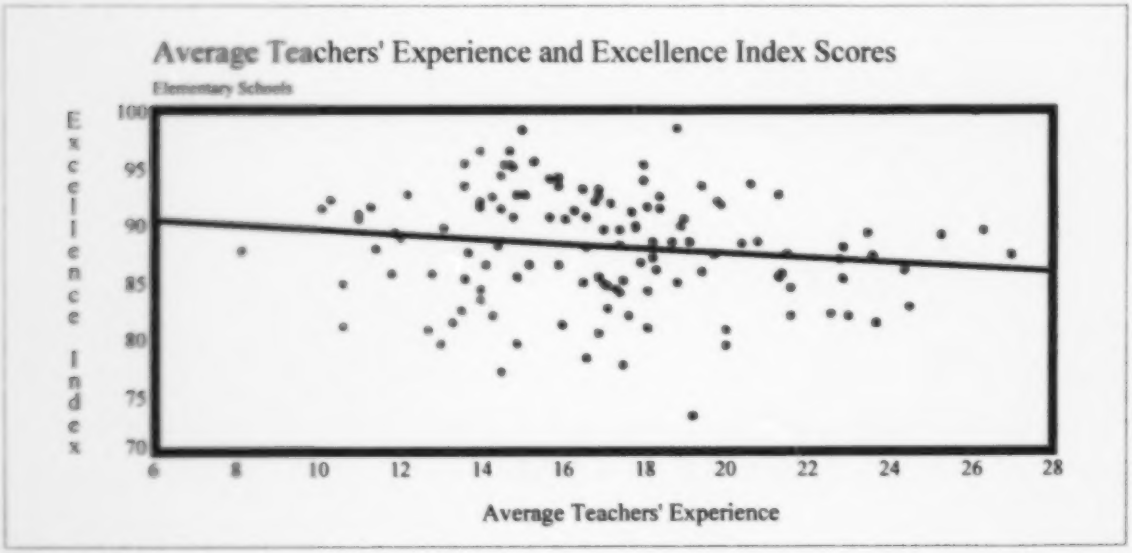

Figure 12

Figures 12 and 13 plot the relationship between average teachers' experience and Excellence

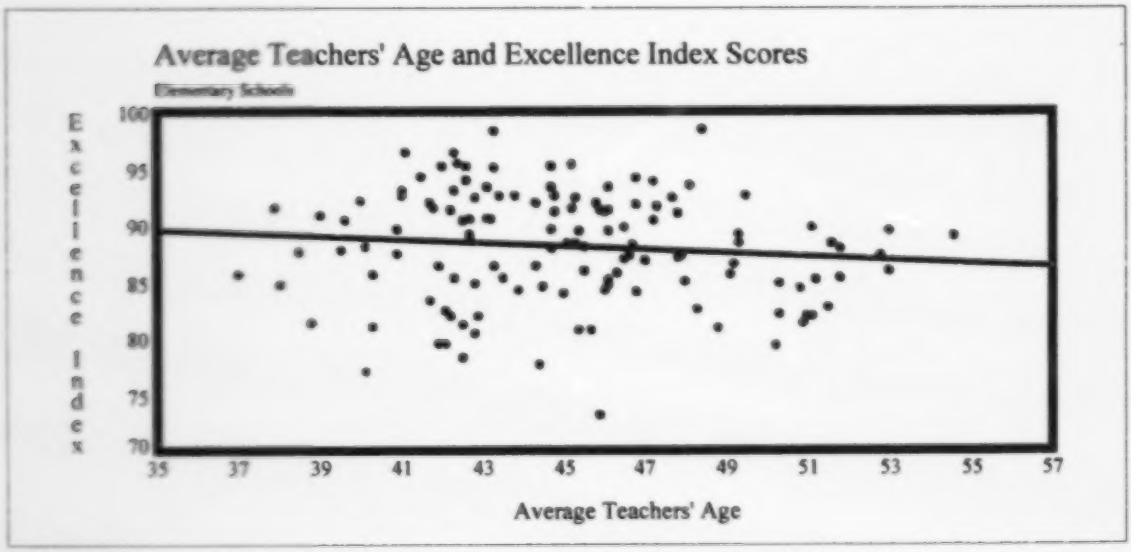

Figure 13

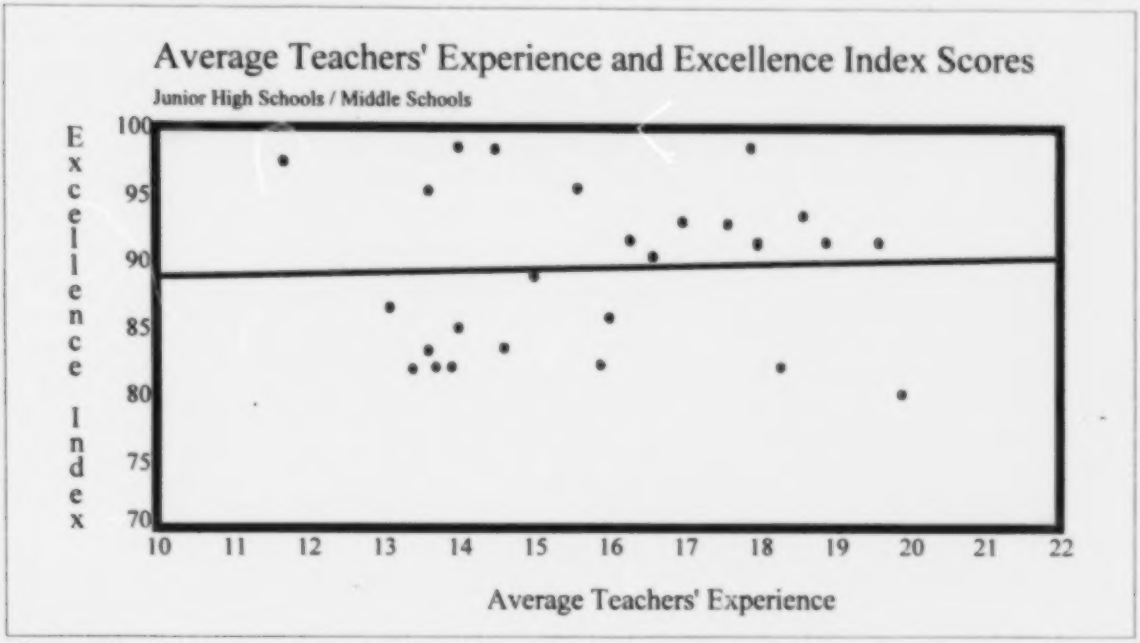

Figure 14

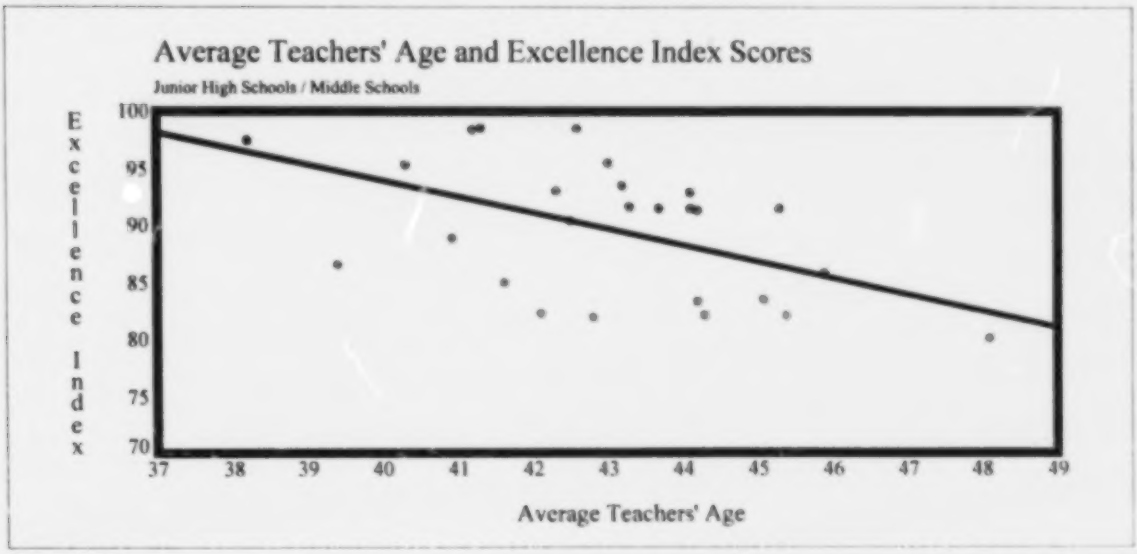

Figure 15

Index scores and between average teachers' age and Excellence Index scores for the Region's elementary schools.[9] In both cases, there is a weak negative association between the variables. As the average teachers' experience increases, Excellence Index scores tend to decrease. As the average

[9] Figure 12: The Pearson Correlation is -0.147. Figure 13: The Pearson Correlation is -0.108. While neither statistic is particularly strong, both are negative.

teachers' age increases, Excellence Index scores again tend to decrease. Neither of these trends is particularly strong.

Figures 14 and 15 plot the relationship between average teachers' experience and Excellence Index scores and between average teachers' age and Excellence Index scores for junior high schools/middle schools.[10] There is virtually no association between teachers' experience and student outcomes. However, the association between teachers' age and student outcomes is moderately strong. As the average teachers' age increases, Excellence Index scores decrease. In fact, for each year and a half's increase in average teachers' age, there is a corresponding drop of a point in Excellence Index score.

Figures 16 and 17 plot the relationships between the same variables for high schools.[11] In this case, both trends are negative. As the average teachers' experience level rises, student outcomes decline. As the average teachers' age increases, student outcomes decline. What is perhaps most

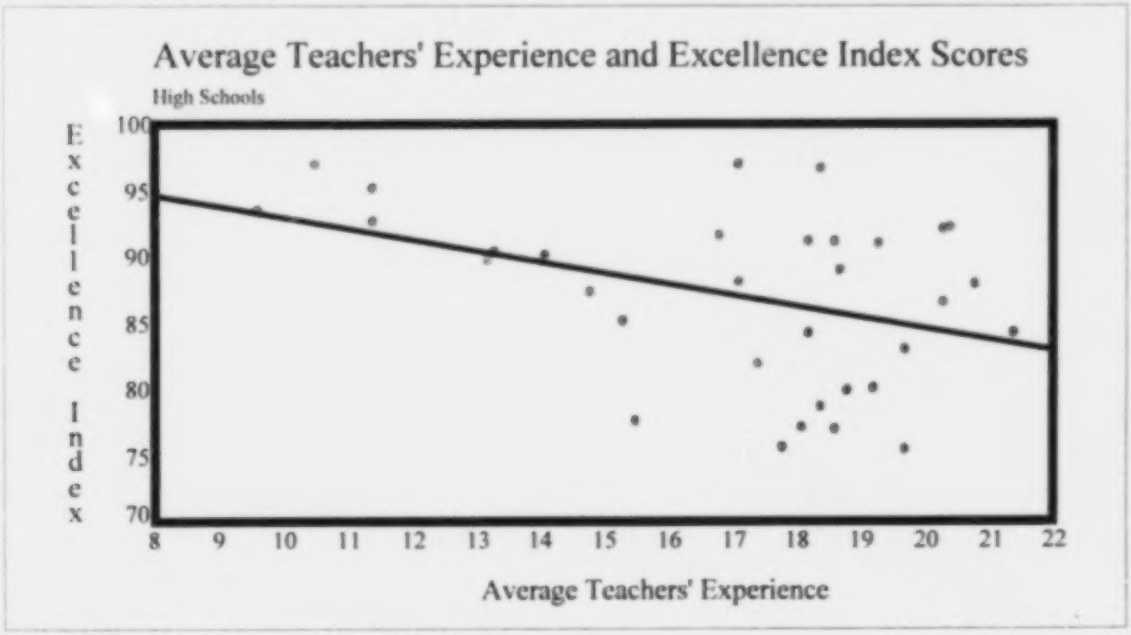

Figure 16

noteworthy is the strength of these trends. While the association between student outcomes and teachers' experience is moderately strong, the association between student outcomes and teachers' age is even stronger.

Obviously, one cannot arbitrarily dismiss teachers as they gain experience. However, the associations between teachers' experience and age and student outcomes highlights the importance

[10] Figure 14: The Pearson Correlation is 0.047. Figure 15: The Pearson Correlation is -0.509. While the correlation between teacher experience and Excellence Index scores is very weak; the correlation between teacher age and Excellence Index scores is moderately strong.

[11] Figure 16: The Pearson Correlation is -0.402. Figure 17: The Pearson Correlation is -0.59. Both of these correlations are negative. While the first is moderately strong, the second is strong.

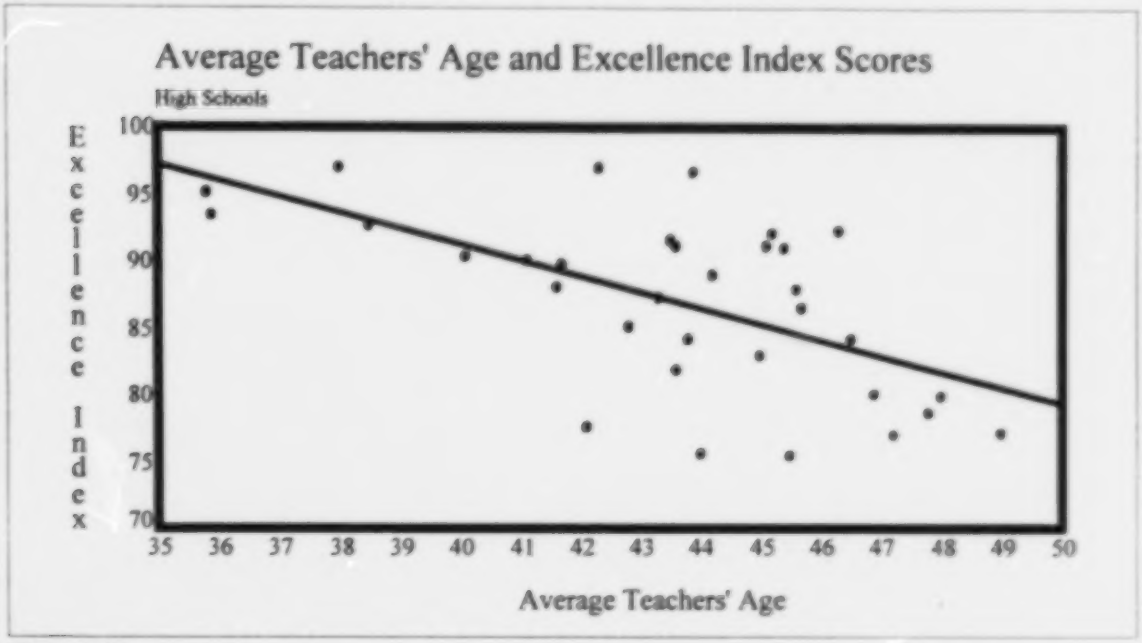

Figure 17

of teachers remaining "young at heart." If, as teachers mature in the profession, they lose their enthusiasm, schools might do well to help teachers find alternative careers outside the classroom. In any case, hiring older, more experienced teachers is not a clear means to improving student outcomes.

VII. Curricula

Many school reform proposals include provisions for school curricula. These proposals are frequently intended not so much to reform schools as to make them relevant. In particular, they are meant to insure that high school graduates will be prepared for college and/or an increasingly technical workplace.

Figure 18 plots the relationship between the number of courses taught in the Region's high schools and Excellence Index scores. As the regression line in Figure 18 suggests, there is a somewhat complex relationship between the number of courses taught in a given school and the outcomes its students achieve. Among schools in which fewer than 80 courses are taught, there is a negative association between the number of courses taught and student outcomes. As the number of courses increases, student outcomes fall. Among schools in which more than 80 courses are taught, there is a positive association between the number of courses taught and student outcomes. As the number of courses increases, student outcomes also increase. While these trends may have many different explanations, they suggest a single conclusion: schools with a clear sense of identity do better than those without such a sense. In other words, schools which offer either a modest curriculum or an expanded curriculum do better than schools which make neither choice.

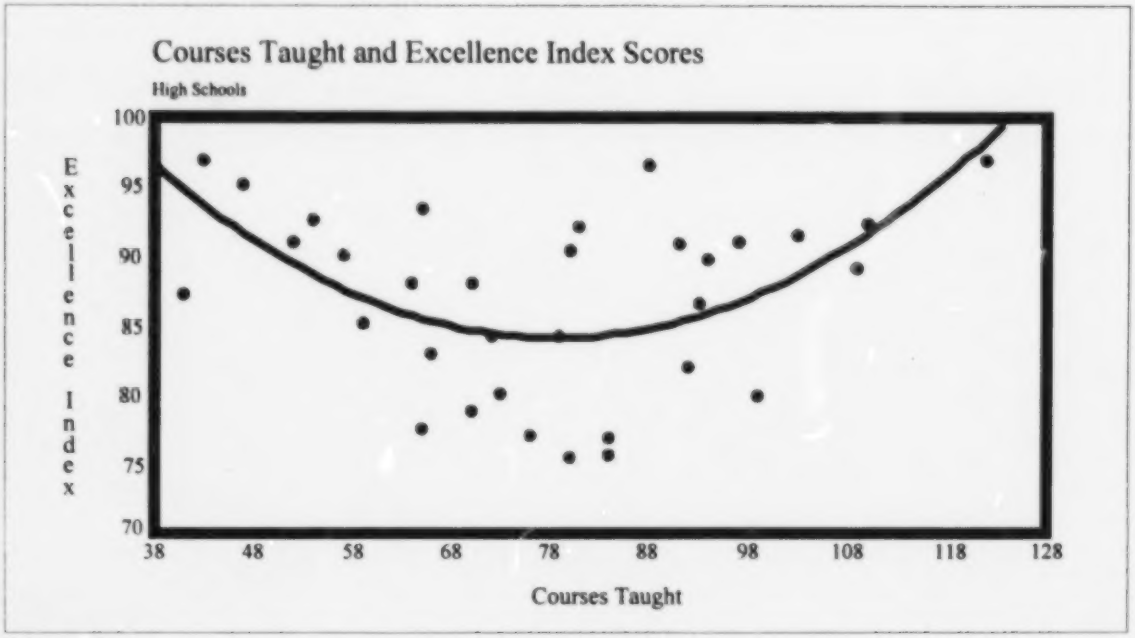

Figure 18

VIII. Schools and their Students

While no proposal for school reform directly addresses the socio-economic character of the communities which the schools serve, it is precisely the socio-economic character of their communities which is most highly correlated with student outcomes.

Figures 19, 20 and 21 plot the relationship between students' socio-economic status and outcomes. (Socio-economic status is measured by the percentage of students in a school who receive free or reduced cost lunches.) In each of these illustrations, there is a strong negative association.[12] As the percentage of students receiving free or reduced cost lunches increases, their academic success decreases sharply. Figure 22 illustrates the same pattern among the Region's school districts.[13]

[12] Among elementary schools (Figure 19), the Pearson Correlation is -0.832; among junior high schools/middle schools (Figure 20), it is -0.903; among high schools (Figure 21), it is -0.854.

[13] Figure 22: The Pearson Correlation is -0.928.

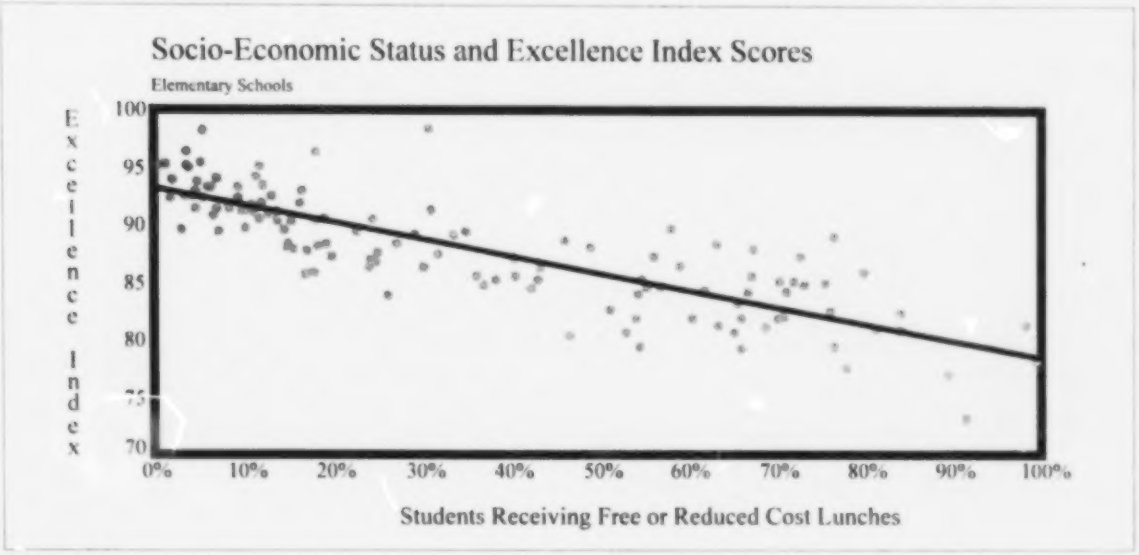

Figure 19

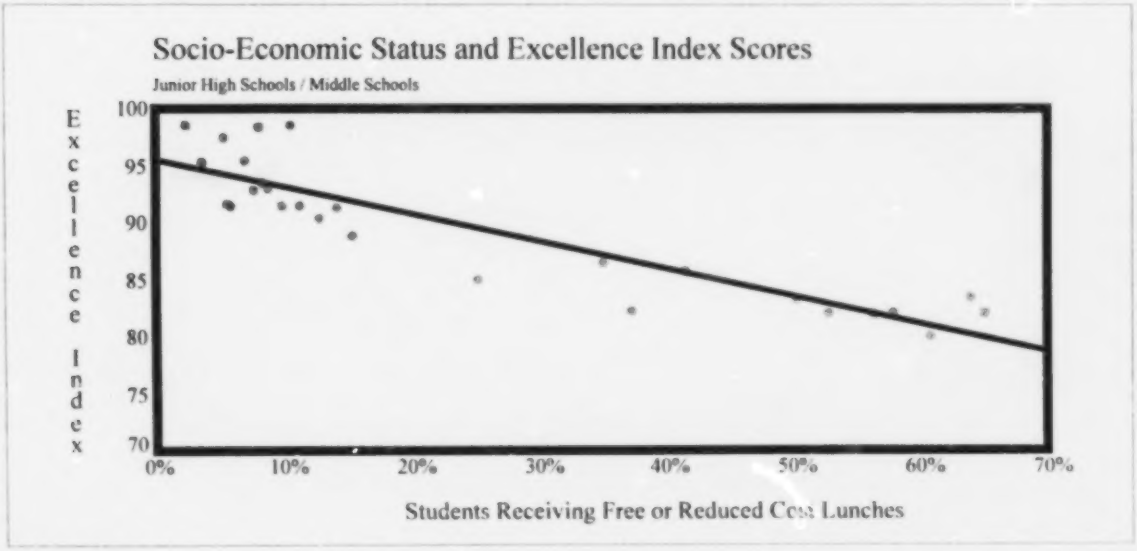

Figure 20

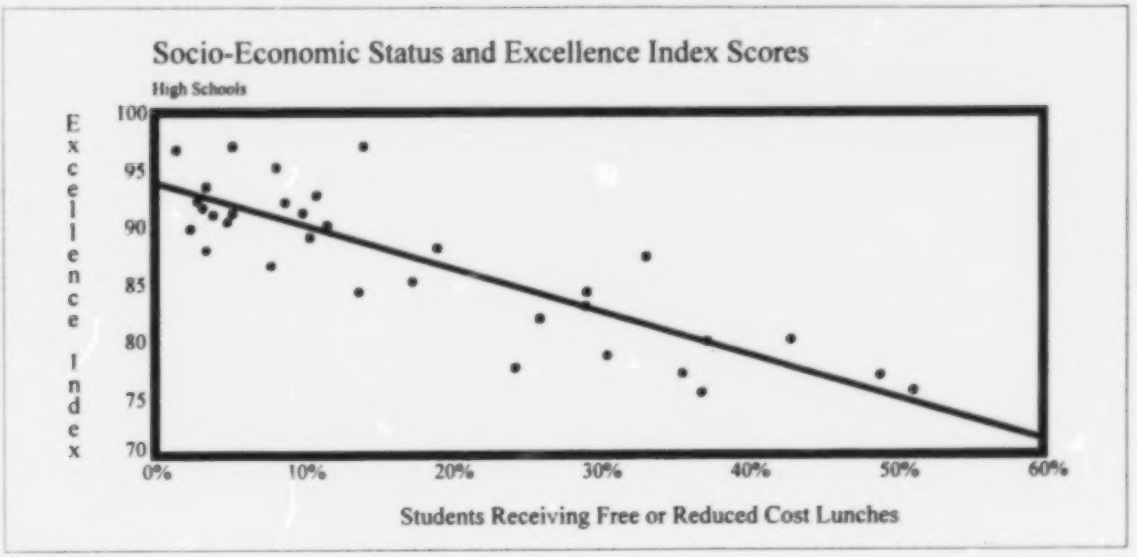

Figure 21

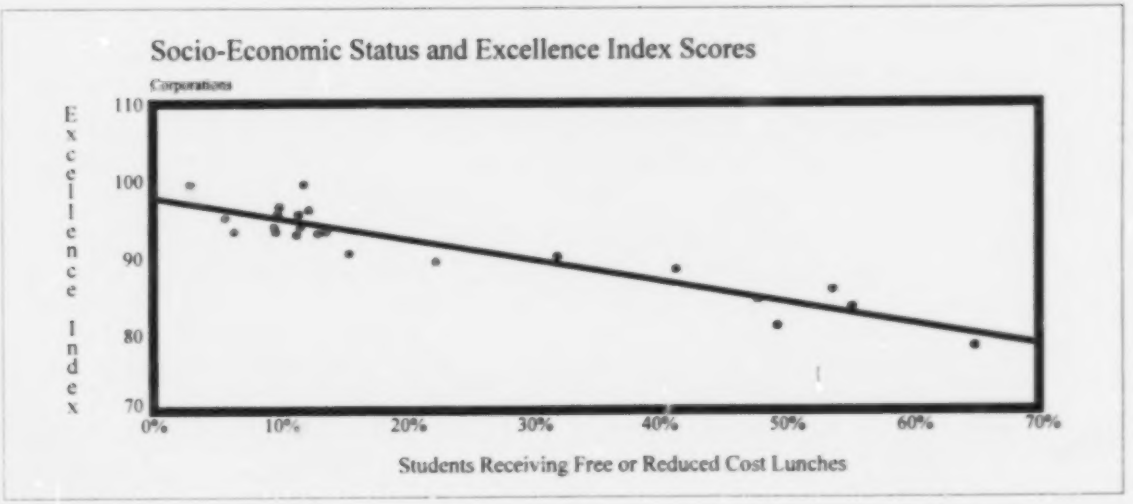

Figure 22

Conclusion

In exploring various dimensions of our schools and their effects upon student outcomes, we have found precious little evidence that any have a significant impact upon student outcomes. Our investigation does suggest a need for nuance in any reform package, a nuance which is particularly sensitive to differences between elementary schools, on the one hand, and junior high schools/middle schools and high schools, on the other. However, our investigation even more cogently suggests that the reforms surveyed in this paper are misdirected. While common wisdom holds that the Region's schools have problems, it seems more likely that the Region has problems which its schools reflect. From this perspective, it is less fair to say that a particular school or school corporation is good or bad and more fair to ask what it is doing given its social context. If, in other words, we wish to improve our schools, we will need to improve our communities.

Still, one must ask why students in the Region's schools are products of their environments. In the past, schools enabled social (and economic) mobility. They gave the vast majority of their students skills which allowed them to enter colleges and universities and to enter higher paying occupations. Certainly, in some schools, for some students, that is still the case. However, one must wonder if the need to produce such examples of success isn't a reason for our current situation. In the past, our schools were understood primarily as *common* schools: common in the sense that all received an equal opportunity. Today, though, the idea of a common school seems to have given way to the metaphor of the school as enterprise. To ensure that its product is marketable, schools frequently use tracking; school corporations of sufficient size create magnet schools. In either case, the result is the same: the schools produce demonstrable successes with which to justify their cost. Again, this situation is not so much one for which our schools are responsible as much as it is one to which they must respond.

Appendix I

Data Used in this Report

All data used in this report was obtained from the Indiana Department of Education and is available to the public on the Department's Idea Net bulletin board.

The author gratefully acknowledges the assistance of Tom Whaley, programmer at IdeaNet, for his assistance in compiling data in a machine readable format.

The variables used in this report are listed below with the names by which they are described on Idea Net.

Attendance Rate 1993-1994
Average Teacher Salary 1993-94
Avg Teacher Age 1993-94
Avg Teachers' Experience 1994-95
Cognitive Skills Index 1993-94
Free Lunch Count 1993-94.
Graduation Rate 1993-94
Istep Total Battery 1993-94
Lunch Count 1993-94
Number of Administrators (FTE) 1994-95
Number of Courses Offered
Number of Teachers (FTE) 1994-95
Reduced Lunch Count 1993-94
SAT Scores (Composite) 1992-93
Tot Expenditure (ALL) / Pup 92 to 94 Avg
Total Enrollment 1993-94

Appendix II

The Index of Excellence

The Index of Excellence is a composite measure of student performance which includes attendance rates, graduation rates, average Indiana Statewide Testing for Educational Progress (ISTEP) scores, average Cognitive Skills Index (CSI) scores and average Scholastic Aptitude Test (SAT) scores. Each of these components was scaled, and the scaled scores were computed for school corporations, for elementary schools, for junior high schools/middle schools, and for high schools.

Scaling of the Components

Each of the Index's five components was scaled in relation to the highest score in the region. The highest score was identified, and all other scores were calculated as a percentage of the highest score.

Among elementary schools, for example, Gary's Benjamin Banneker had an average ISTEP score of 82.5 while East Chicago's Carrie Gosch had a score of 37.0. Since Banneker's score was the highest in the region, it had a scaled score of 100. By contrast, Gosch's scaled score was 43.4.

Since the scaled scores are benchmarked by the highest score in Northwest Indiana, many will be interested in those benchmarks. For the sake of those with such an interest, the following tables list the regional benchmark, the regional average, and the statewide average. (Please note that averages for both regional and statewide corporations are unweighted averages.)

Attendance Rates				
	Regional Benchmark			
Unit	Score	Reporting Unit	Regional Average	State Average
Corporations	96.69	Valparaiso Community Schools	95	95.8
Elementary	97.48	Benjamin Banneker (Gary)	95	96.05
Jr High/Middle	99.03	Dumbar-Pulaski (Gary)	95	95.06
Sr High	97.58	Emerson School (Gary)	94	94.74

Graduation Rates				
	Regional Benchmark			
Unit	Score	Reporting Unit	Regional Average	State Average
Corporations	96.3	E Porter County	89	95.8
Sr High	100.0	Emerson School (Gary)	89	96.05

Average ISTEP Scores				
	Regional Benchmark			
Unit	Score	Reporting Unit	Regional Average	State Average
Corporations	73.04	Valparaiso Community Schools	62.4	63.1
Elementary	85.2	Benjamin Banneker (Gary)	63.4	
Jr High/Middle	72.9	Benjamin Franklin (Valparaiso)		
Sr High	72.6	Morgan Township (E Porter Co)		

Average CSI Scores				
	Regional Benchmark			
Unit	Score	Reporting Unit	Regional Average	State Average
Corporations	117.2	Valparaiso Community Schools	109.4	109.5
Elementary	121.0	Northview (Valparaiso) Flint Lake (Valparaiso)	107.9	109.0
Jr High/Middle	118.0	Benjamin Franklin (Valparaiso) Wilbur Wright (Munster)	107.3	108.7
Sr High	118.0	Morgan Township (E Porter Co)	106.5	108.1

Average SAT Scores				
	Regional Benchmark			
Unit	Score	Reporting Unit	Regional Average	State Average
Corporations	940	Valparaiso Community Schools	835	866
Sr High	992	Kouts Jr-Sr (E Porter Co)	808	

Availability of the Data and Weighting

Not all components were available for each unit for which the Index of Excellence was computed.

For school corporations and for high schools, all components were available and none were weighted.

For elementary schools and for junior high schools/middle schools, neither graduation rates nor average SAT scores were available. As a result, other components were weighted. Attendance rates were weighted by a factor of two. Both the average ISTEP score and the average CSI score were weighted by a factor of 1.5.

Computation of the Index

The scaled scores were summed and averaged to create the Index of Excellence.

Index of Excellence Scores: School Corporations		
Corp	Name	Score
4580	Hanover Community School Corp (HNVR)	93.58
4590	River Forest Community Sch Corp (RIVFOR)	85.92
4600	Merrillville Community School (MRLVL)	93.31
4615	Lake Central School Corp (LKCENT)	95.37
4645	Tri-Creek School Corp (TRICRK)	93.04
4650	Lake Ridge Schools (LKRDG)	81.23
4660	Crown Point Community Sch Corp (CRWNPT)	95.79
4670	School City of East Chicago (ECHI)	78.61
4680	Lake Station Community Schools (LKSTA)	88.66
4690	Gary Community School Corp (GARY)	83.70
4700	Griffith Public Schools (GRFTH)	93.48
4710	School City of Hammond (HAM)	84.64
4720	School Town of Highland (HILND)	95.69
4730	School City of Hobart (HBRT)	90.61
4740	School Town of Munster (MNSTR)	99.64
4760	Whiting School City (WHTNG)	90.19
6460	M S D Boone Township (MSDB)	94.18
6470	Duneland School Corporation (DUNLND)	94.11
6510	East Porter County School Corp (EPRTR)	96.46
6520	Porter Township School Corp (PRTRTN)	93.49
6530	Union Township School Corp (UNNTN)	96.74
6550	Portage Township Schools (PORTTN)	89.56
6560	Valparaiso Community Schools (VALPO)	99.60

Index of Excellence Scores: Elementary Schools

School	Corp	Name	Score
3753	TRICRK	Oak Hill Elementary School	93.12
3769	CRWNPT	Douglas MacArthur Elem Sch	89.35
3773	CRWNPT	Dwight D Eisenhower Elem Sch	92.62
3781	HNVR	Jane Horton Ball Elem Sch	90.59
3797	RIVFOR	Henry S Evans Elementary Sch	85.80
3801	RIVFOR	River Forest Elementary Sch	87.35
3805	RIVFOR	John I Meister Elementary School	85.52
3821	MRLVL	Henry P Fieler Elem Sch	88.31
3822	MRLVL	Homer Iddings Elem Sch	92.52
3826	MRLVL	Edgar L Miller Elem Sch	91.41
3827	MRLVL	John Wood Elementary School	91.84
3829	MRLVL	Jonas E Salk Elem Sch	88.54
3837	LKCENT	Kolling Elementary School	95.41
3839	LKCENT	George Bibich Elementary Sch	95.35
3840	LKCENT	James H Watson Elem Sch	95.59
3843	LKCENT	Protsman Elementary School	92.50
3845	TRICRK	Lake Prairie Elementary Sch	87.99
3848	TRICRK	Three Creeks Elem School	90.66
3854	CRWNPT	Winfield Elementary School	92.66
3881	LKRDG	Grissom Elementary School	84.85
3885	LKRDG	Longfellow Elementary School	89.63
3889	LKRDG	Hosford Park Elementary	85.39
3897	LKRDG	Black Oak Elementary School	86.71
3903	CRWNPT	Lake Street Elementary School	91.51
3905	CRWNPT	Solon Robinson Elementary Sch	94.29
3913	CRWNPT	Timothy Ball Elementary Sch	92.64
3929	ECHI	Eugene Field Elem Sch	78.36
3933	ECHI	Benjamin Franklin Elem Sch	83.52
3937	ECHI	Carrie Gosch Elem Sch	73.34
3941	ECHI	Benjamin Harrison Elem Sch	82.15
3945	ECHI	Abraham Lincoln Elem Sch	79.63
3953	ECHI	William McKinley Elem Sch	80.61
3961	ECHI	George Washington Elem School	81.32
3973	LKSTA	Alexander Hamilton Elem Sch	85.70
3975	LKSTA	Virgil I Bailey Elem Sch	88.77

Index of Excellence Scores: Elementary Schools

School	Corp	Name	Score
3977	LKSTA	Central Elementary School	86.46
3985	LKSTA	Carl J Polk Elementary School	84.74
4045	GARY	Aetna Elementary School	79.42
4053	GARY	Benjamin Banneker Elem Sch	98.51
4061	GARY	Beveridge Elementary School	82.03
4065	GARY	Brunswick Elementary School	82.20
4069	GARY	George Washington Carver Sch	85.32
4073	GARY	William Merritt Chase School	82.04
4077	GARY	Frederick Douglass Elem Sch	89.13
4081	GARY	Charles R Drew Elementary	82.75
4086	GARY	David O Duncan Elem School	84.98
4087	GARY	Spaulding Elementary School	81.04
4089	GARY	Benjamin Franklin Elem School	85.31
4101	GARY	Ivanhoe Elementary School	88.60
4104	GARY	Jefferson Elementary School	87.43
4109	GARY	Kuny Elementary School	84.44
4117	GARY	Alain L Locke Elementary Sch	85.44
4121	GARY	Jacques Marquette Elem School	81.53
4125	GARY	Arthur P Melton Elem School	79.68
4133	GARY	Nobel Elementary School	82.80
4137	GARY	Horace S Norton Elem Sch	88.13
4141	GARY	Pittman Square Elem Sch	84.23
4149	GARY	Ernie Pyle Elementary School	87.49
4153	GARY	James Whitcomb Riley Elem Sch	80.80
4157	GARY	John H Vohr Elementary School	86.12
4161	GARY	George Washington Elem School	85.18
4165	GARY	Daniel Webster Elem Sch	89.87
4169	GARY	Daniel Hale Williams Elem Sch	84.52
4171	GRFTH	Beiriger Elementary School	91.65
4181	GRFTH	Franklin Elementary School	92.13
4185	GRFTH	Eldon Ready Elementary School	88.11
4189	GRFTH	Elsie Wadsworth Elem Sch	89.83
4285	HILND	Judith Morton Johnston Elem	89.90
4290	HILND	Mildred Merkley Elem School	92.08
4301	HILND	Southridge Elementary School	93.49

Index of Excellence Scores: Elementary Schools

School	Corp	Name	Score
4303	HILND	Allen J Warren Elem Sch	93.18
4311	HBRT	George Earle Elementary Sch	88.25
4313	HBRT	Foreman Elementary School	91.91
4317	HBRT	Liberty Elementary School	90.68
4321	HBRT	Mundell Elementary School	90.51
4325	HBRT	Ridge View Elementary School	90.72
4337	MNSTR	James B Eads Elementary Sch	93.98
4341	MNSTR	Ernest R Elliott Elem Sch	94.06
4343	MNSTR	Frank H Hammond Elem Sch	95.31
4349	LKCENT	Homan Elementary School	92.26
4351	LKCENT	Peifer Elementary School	95.19
4361	WHTNG	Nathan Hale Elementary School	85.74
4425	HAMND	Henry W Eggers Elem/Md Sch	82.13
4435	HAMND	A L Spohn Elem/Middle Sch	77.80
4441	HAMND	Lee L Caldwell Elem Sch	85.02
4447	HAMND	Columbia Elementary School	82.61
4449	HAMND	Thomas A Edison Elem Sch	87.67
4451	HAMND	Benjamin Franklin Elem Sch	86.54
4453	HAMND	Warren G Harding Elem Sch	84.08
4455	HAMND	Washington Irving Elem Sch	80.83
4457	HAMND	Thomas Jefferson Elem Sch	89.58
4459	HAMND	Kenwood Elementary School	87.75
4461	HAMND	Lafayette Elementary School	81.42
4463	HAMND	Abraham Lincoln Elem Sch	84.91
4465	HAMND	Maywood Elementary School	77.23
4469	HAMND	Morton Elementary School	88.53
4471	HAMND	Orchard Drive Elem Sch	86.98
4475	HAMND	James Whitcomb Riley Elem Sch	88.17
4479	HAMND	Lew Wallace Elementary School	84.43
4483	HAMND	Woodrow Wilson Elem Sch	81.13
6815	MSDB	Hebron Elementary School	91.02
6817	DUNLND	Jackson Elementary School	92.65
6819	DUNLND	Brummitt Elementary School	91.26
6823	DUNLND	Liberty Elementary School	91.26
6828	EPRTR	Morgan Township School (E)	90.48

Index of Excellence Scores: Elementary Schools

School	Corp	Name	Score
6835	EPRTR	Kouts Elementary School	91.55
6837	PRTRTN	Boone Grove Elementary School	89.71
6840	PRTRTN	Porter Lake Elementary School	89.69
6845	UNNTN	Union Center Elementary Sch	92.48
6846	UNNTN	John Simatovich Elem Sch	92.65
6852	EPRTR	Washington Township School (E)	91.60
6857	PORTTN	Wallace Aylesworth Elementary	87.53
6861	PORTTN	Crisman Elementary School	87.13
6865	PORTTN	Central Elementary School	86.47
6869	PORTTN	Ethel R Jones Elem Sch	93.60
6874	PORTTN	Rowena Kyle Elementary School	88.50
6876	PORTTN	Paul Saylor Elementary School	89.36
6877	PORTTN	George L Myers Elem Sch	86.09
6879	PORTTN	South Haven Elementary School	85.95
6888	VALPO	Thomas Jefferson Elem Sch	95.34
6891	VALPO	Central Elementary School	91.41
6893	VALPO	Flint Lake Elementary Sch	96.59
6897	VALPO	Cooks Corner Elementary Sch	96.51
6909	VALPO	Hayes-Leonard Elementary Sch	93.52
6913	VALPO	Memorial Elementary School	92.12
6917	VALPO	Northview Elementary School	98.37
6921	VALPO	Parkview Elementary School	94.32
6928	DUNLND	Bailly Elementary School	93.54
6941	DUNLND	Newton Yost Elementary School	91.11

Index of Excellence Scores:
Junior High Schools / Middle Schools

School	Corp	Name	Score
3761	CRWNPT	Robert Taft Junior High Sch	91.57
3795	RIVFOR	River Forest Jr High School	86.71
3811	MRLVL	Pierce Middle School	91.73
3813	MRLVL	Harrison Middle School	91.63
3831	LKCENT	Michael Grimmer Middle School	95.52
3841	LKCENT	Kahler Middle School	97.55
3851	TRICRK	Lowell Middle School	92.98
3893	LKRDG	Lake Ridge Middle School	82.45
3963	ECHI	Joseph L Block Jr High School	82.28
3967	ECHI	West Side Junior High School	80.29
4017	GARY	Thomas A Edison School	82.05
4037	GARY	Tolleston Middle School	85.95
4103	GARY	Bailly Middle School	82.26
4107	GARY	Alfred Beckman Middle School	82.19
4123	GARY	Kennedy-King Middle School	83.47
4145	GARY	Dunbar-Pulaski Middle School	83.58
4177	GRFTH	Griffith Junior High School	91.58
4283	HILND	Highland Middle School	93.58
4309	HBRT	Hobart Middle School	90.53
4333	MNSTR	Wilbur Wright Middle School	98.66
4433	HAMND	Charles N Scott Middle School	85.18
6821	DUNLND	Liberty Middle School	95.58
6859	PORTTN	William Fegely Middle School	89.02
6871	PORTTN	Willowcreek Middle School	91.44
6885	VALPO	Benjamin Franklin Mid Sch	98.76
6887	VALPO	Thomas Jefferson Middle Sch	98.59
6927	DUNLND	Westchester Middle School	93.18

Index of Excellence Scores: High Schools

School	Corp	Name	Score
3785	HNVR	Hanover Central High School	91.26
3791	RIVFOR	River Forest Sr High School	83.13
3809	MRLVL	Merrillville Senior High Sch	91.26
3833	LKCENT	Lake Central High School	91.73
3865	TRICRK	Lowell Senior High School	90.52
3869	LKRDG	Calumet High School	77.75
3901	CRWNPT	Crown Point High School	92.46
3924	ECHI	East Chicago Central High Sch	75.74
3965	LKSTA	Thomas A Edison Jr-Sr HS	85.34
4025	GARY	Horace Mann School	80.22
4029	GARY	Lew Wallace High School	77.29
4033	GARY	Theodore Roosevelt High Sch	77.14
4041	GARY	William A Wirt Sr High Sch	78.92
4163	GARY	West Side High School	80.11
4168	GARY	Emerson School	87.46
4173	GRFTH	Griffith Senior High School	88.15
4281	HILND	Highland High School	92.28
4305	HBRT	Hobart High School	86.69
4332	MNSTR	Munster High School	96.82
4353	WHTNG	Whiting Jr-Sr High School	88.21
4411	HAMND	George Rogers Clark Md/HS	82.13
4413	HAMND	Donald E Gavit Md/High Sch	84.35
4415	HAMND	Hammond High School	75.68
4417	HAMND	Morton Senior High School	84.41
6813	MSDB	Hebron Jr-Sr High Sch	90.27
6825	EPRTR	Morgan Township School (H)	97.10
6833	EPRTR	Kouts Jr-Sr High School	95.35
6838	PRTRTN	Boone Grove Jr-Sr High School	89.86
6841	UNNTN	Union Twp Mdl/Wheeler High Sch	93.56
6849	EPRTR	Washington Township (H)	92.84
6853	PORTTN	Portage High School	89.21
6881	VALPO	Valparaiso High School	97.09
6925	DUNLND	Chesterton Senior High School	91.10

Appendix III

Statistics Used in This Paper

Since some readers may be intimidated by statistical analysis, this appendix will provide a concise overview of the statistics used in this report.

In today's world, we are frequently exposed to statistics: the President's popularity level, the GNP growth rate, major league batting averages—to name only a few. Statistics such as these answer simple, direct questions such as "Is the president likely to be re-elected?" and "Is the batter likely to get a hit?"

For better or worse, many questions aren't simple and direct. We may, for example, want to know whether the President's popularity level varies in relation to changes in a typical worker's take-home pay. Or, we may want to know whether a team's record varies in relation to its batting average. Answers to questions such as these demand that we measure the extent to which one variable is associated with another.

Two variables are said to be associated if the distribution of one changes under the other. If, for example, sales of widgets increase by 10% every time there is a 5% drop in their price, it's clear that the price and sales of widgets are associated.

One of the most widely used measures of association is Pearson's *r*.[14] Pearson's *r* measures both the strength and the direction of a correlation. Two variables are *negatively* correlated if one increases as the other *decreases*. The price and sales of widgets, for example, are negatively correlated since sales increase as the price decreases. Two variables are *positively* correlated in one increases as the other also *increases*. Calories consumed and weight, for example, tend to be positively correlated: the more calories one consumes, the more one weighs. Pearson's *r* varies from 0 to ±1 with 0 indicating no association, +1 indicating a perfect positive association, and -1 indicating a perfect negative association. Values from 0 to ±0.3 are usually described as *weak* correlations; values from ±0.3 to ±0.6 are usually described as *moderate* correlations; and values from ±0.6 to ±1.0 are usually described as *strong* correlations.

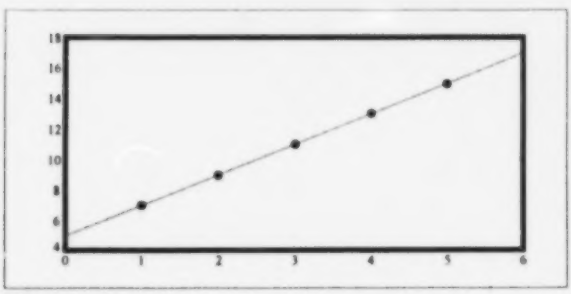

Figure 23

Besides measuring the direction and strength of the relationship between two variables, we frequently want to know how to describe the relationship. Sometimes the relationship is readily apparent. Figure 23, for example, illustrates a perfect, positive association (Pearson's *r* is +1.00) between two variables. The line which connects the data points in Figure 23 is called a regression line. A regression line is a line from which variation in the data is minimized. Since there is a

[14] Statisticians are frequently concerned with tests of significance, that is, whether the distribution of a variable in a given sample accurately reflects the distribution of the same variable in the population from which the sample was drawn. However, the data in this report describes populations, that is, all the school corporations in Lake and Porter counties, all the elementary schools in those corporations, etc. As a result, tests of significance are not explained here.

perfect relationship between the two variables in Figure 23 every data point is on the regression line. Figure 24 is like Figure 23. It plots a number of data points and a regression line has been drawn. However, Figure 24's two variables are not perfectly correlated. Some points are above the regression line; others are below the regression line. In this case, it is obvious that the regression line minimizes the distance between its points and those of the data.

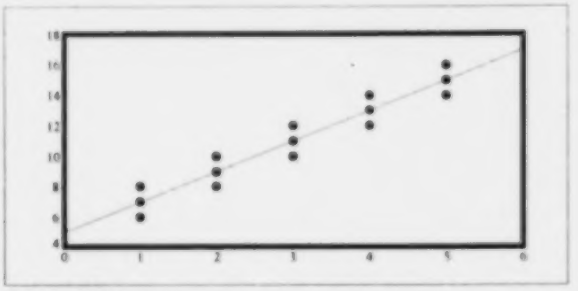

Figure 24

Since the regression line is a line, it may be defined by an equation. When the line is a straight line, the equation is always of the form

$$y = \beta x + c$$

where x and y are variables, β is the slope of the line and c is the value of the y-intercept, the point at which the line crosses the y-axis when x is equal to 0. Since a regression line is defined by a mathematical formula, it may be used to predict the relationship between any variables x and y. Of course, such predictions are predictions; they are likely—but not necessarily—true. If the predictions concern values which lie beyond the range of the data being analyzed, they must be approached more cautiously.

As one might imagine, the mathematical computation of a regression line is tedious if done with paper, pencil and calculator. Luckily, most statistical computer programs are capable of doing the necessary calculations and produce a definition of the regression line, various other measures, and a graph in which the regression line has been drawn with only a few keystrokes.

A number of statistics describe the relationship between a regression line and the data points which it summarizes. These measures are extremely important to the professional statistician; however, they need not concern readers of this paper. In this paper, regression lines have been drawn only as an aid to the reader. They make trends in the data more obvious to the less trained eye.

Obviously, a regression line will suggest a trend in the data only if there is a trend in the data. If there is no trend, a regression line would closely resemble the average value of the y variable. When, in this paper, there is no trend in the data, no regression line has been drawn. Instead, a line which represents the average value of the y variable has been drawn as a reference line. In these cases, the line is labeled as an average.

The author gratefully acknowledges the assistance of Tom Whaley, Indiana Department of Education's Idea Net, in preparing a machine readable file for the data used in this study. Thanks also to George Sufana, Heartland Center intern, who made initial inquiries with INDOE.